The Great Recoinage of 1696: Charles Davenant and monetary theory

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In 1695 the English currency was in a state of distress and a small number of eminent persons were invited to address the crisis. John Locke and Isaac Newton were among the most prominent members of this distinguished group, which included Sir Christopher Wren, John Wallis, Gilbert Heathcote, John Asgill, Sir Josiah Child and Charles Davenant.[1] Davenant (1656-1714), who provides the focus of this essay, was a political arithmetician and economic policymaker from 1686 to 1714. His work on the recoinage informs our understanding of the debate and offers an important glimpse into the economic world of the 1690s as it moved from a specie monetary-base driven view of policy to one founded on financial instruments.[2] The recoinage plan put forward by Locke and his supporters (in most if not all its principles) was eventually adopted. Davenant proposed an alternative in two unpublished contributions, 'A memorial concerning the coyn of England' (1695) and 'A memoriall concerning creditt' (1696), which describe the functioning of the English credit system at the cusp of the Financial Revolution.

The Financial Revolution itself is more than just the institutional developments, such as the creation of the Bank of England in 1694, that took place during the last part of the seventeenth century and the early part of the eighteenth century in England.[3] The emergence of new financial instruments fundamentally changed the way that commerce was viewed. The English monetary system was no longer based only on the coins of the realm, but was now something much broader, incorporating paper money, bills of exchange and various financial instruments that underwrote merchants, the military and the state itself.[4]

1. See Kelly, 'General introduction', in *Locke on money*, vol.1, p.25. A selection of the contributions appears in Li, *The Great Recoinage*, p.183-200, 217-36.
2. The monetary base is considered that part of the money supply that consists solely of notes and coin in circulation. It is sometimes termed high-powered money. Notes during the 1690s would have had several sources, so a precise measure of the monetary base is therefore difficult.
3. Dickson, *The Financial Revolution in England*.
4. This new financial world developed gradually, beginning with the financial transactions that supported the Florentine woollen trade in the fifteenth century. This innovation

The key impetus for these innovations was to enable the state to develop the financial resources necessary to sustain a protracted war with France (the Nine Years' War, 1688-1697).[5]

The economic crisis of the 1690s, caused by related pressures associated with this war and the problem of England's silver coin, which was severely depleted by clipping, had to be addressed by Parliament and the Treasury. Although the Bank of England was the first bank to be designed from the beginning as a financial arm of the state it was limited in its functions insofar as it lacked the financial capacity to act as a lender of last resort and the legal authority to regulate the monetary sector of the economy. This means that in the 1690s the response to the situation took place through temporary commissions, such as the one served on by Locke, Newton, Davenant and their colleagues.

In 1696, facing these monetary difficulties, England made the fateful decision to recoin all its silver currency. This choice eventually led to the economic policy that created the famed British Gold Standard and subsequently the International Gold Standard. Thus it was a moment of lasting significance. Yet the story behind the recoinage has been told in what can be considered a rather limited way. J. R. McCulloch, the first to describe the importance of this period, in 1856, framed the question of recoinage as a debate between John Locke, Lord Somers, acting on behalf of the king, William Lowndes of the Treasury and Isaac Newton, future Master of the Mint.[6] Despite his giving prominence to these individuals in the debate, all the figures asked to give their advice presented the Lords Justices (the regency council which governed in William III's absence on campaign) with options for improving the monetary situation of England. This essay will focus primarily on Davenant's contribution, addressed to the Lord Treasurer, Sidney Godolphin, who secured Davenant's participation.[7]

The currency crisis resulted from developments in the international bullion market and institutional neglect, causing such a significant deterioration of silver-based coins in circulation that the state felt that it was forced to respond.[8] As financial instruments became more ad-

over time was transformed into the system of finance that drove Venice, Amsterdam and Antwerp.

5. Brewer, *The Sinews of power*; Niall Ferguson, *The Cash nexus: money and power in the modern world, 1700-2000* (London, 2001).
6. J. R. McCulloch, 'Note on the re-coinage of 1696-1699', in *A Select collection of scarce and valuable tracts on money*, ed. J. R. McCulloch (London, 1856), p.261-65. Newton became Warden of the Mint in 1696 and Master in 1700.
7. Kelly, '"Monkey business": Locke's "College" correspondence', p.154.
8. Li, *The Great Recoinage*; Horsefield, *British monetary experiments 1650-1710*; William Shaw, *The History of the currency 1252 to 1894* (London, 1895); William Shaw (ed.), *Select tracts and documents illustrative of English monetary history 1626-1730* (London, 1896).

vanced, and with a greater breadth and depth of institutions to support them, money became much more complex than simply precious metal coins (specie) in circulation. Yet specie still defined money and wealth in the minds of many policymakers and economic thinkers (tantamount to bullionism[9]). Given this, it was natural for the policy response to the difficulties facing the silver coin of England to be considered from a purely specie point of view. Nonetheless, a solely specie-approach to monetary policy was no longer advisable due to the developments in financial instruments since the 1660s. This essay will consider the development of monetary theory and policy as it attempted to react to market and institutional developments.

First, I will discuss the monetary system as it existed in 1690s England. This can be broken down into two analytical issues, one being the poor state of silver coin necessitating the recoinage, and the other being the disequilibrium in the price ratio between silver and gold. Second, I will discuss the traditional view of the Locke, Lowndes and Newton debate. Third, I will assess Davenant's role in this debate and his importance in the development of monetary thought. Finally, I will explain some of the effects of the recoinage. While the preoccupation of Enlightenment thinkers with money and political economy is widely recognised, insufficient attention has been given to the recoinage controversy in the 1690s as a crucible for developments in reflection on the nature of credit and the function of the circulating medium.

The institutional context – money and the economy in 1690s England

Today monetary policy is a function of the Central Bank. The policies of the European Central Bank are quite clear, with the predominant model of the Taylor Rule explaining many changes in monetary policy.[10] Despite the numerous financial instruments that make up the money supply, the monetary base or high-powered money is relatively simple to understand and account for in the market. In the early modern period the monetary base was specie – gold and silver – but the bimetallic specie standard proved very difficult to maintain.

9. Bullionism is the confusion of specie money (gold and silver) with the wealth of the nation. The so-called 'mercantilist' authors are commonly associated with confusing bullion with the national wealth. The wealth of a nation comes from its output and in modern terms is described in Keynesian national income terms: Gross Domestic Product/ National Income (Y) = Consumption (C) + Investment (I) + Government Expenditure (G) + the Trade Balance (Exports (X) – Imports (M)).
10. An explanation of the Taylor Rule can be found Athanasios Orphanides, 'Taylor rules', in *The New Palgrave dictionary of economics*, 2nd edn, ed. Steven N. Durlauf and Lawrence E. Blume, 8 vols (Houndmills, Basingstoke, 2008), vol.8, p.200-204.

Monetary systems that are based on specie are significantly different from systems of fiat money now in use.[11] The essential component of a specie standard is that the market price of precious metals is kept at a parity level (or so close to it that transaction costs eliminate profits) vis-à-vis the Mint price of the coin.[12] The public acceptance of coins required that they be fairly consistent in weight, and despite fabrication limitations the coinage was largely adequate. However, in the 1690s, the effects of clipping the coinage had resulted in the specie system being strained as the face value of the coinage did not correspond with the actual metal content. These complications resulted in the eroding of confidence in the coin and the rising of transaction costs.

As the coinage deteriorated, the ability to judge coins as full weight, genuine or counterfeited became more difficult. Questioning the validity of the coinage resulted in higher transaction costs. Simultaneously it lowered government revenues as coins of low weight were returned to the Treasury for tax purposes. William Lowndes writes in his *Report containing an essay for the amendment of the silver coins* (1695) how the revenues of the Crown had been significantly reduced by lack of bullion.[13]

The English economy, like almost all economies of the late seventeenth century, was intimately linked to its bullion-based currencies. A corruption of the coinage was not only potentially inflationary, but also destructive to the very fabric of the economy and political establishment at large. The coinage problem had its origins in the coin being the monetary base of a specie system. Given that precious metals had a market price, coins could be clipped or shaved and the silver or gold gained could be melted into bullion and sold. Even when clipped, the coin could still circulate, since it would not have been perfectly round or correctly stamped in the first place. This was the basic problem of the 1690s: as the bullion market price of silver rose, there were profits to be made from clipping the coinage. The invention of milling at the edges in

11. The US Dollar, UK Sterling, the Japanese Yen and the Euro are the primary examples (in fact all modern currencies, though many small currencies are 'pegged', that is, linked to one of the larger currencies in a *de facto* or *de jure* fashion).
12. The coin would be defined as having a certain precious metal content (measured in carats, like the metal content of modern jewelry, 24 carats indicating purity) and that metal would be mixed with a baser metal such as copper, nickel or tin. The stamp on the coin would ensure that the coin would not have to be assayed upon receipt, since the Mint, by the sovereign stamp, ensured the fineness of the precious metal in the coin. The process of clipping the coin undermined the stamp of the state, since there is obviously *less* precious metal content in the coin. Even the routine process of wear and tear will result in the coins' value coming into question.
13. See the table indicating the deficiency in weight of coin as measured at the Treasury in William Lowndes, *A Report containing an essay for the amendment of the silver coins*, p.159.

1662 had provided some assistance with the problem but coins in this form were not produced in great volumes and were typically hoarded. Thus the continued use of handicraft methods for the fabrication of the coins (as opposed to mechanical devices powered by horses or water-wheels) meant that milling remained of little use. Although milling was designed to prevent clipping, coins produced with minting errors remained in constant circulation it became difficult to discern clipped coins from coins that were carelessly produced. This enabled the coins to be clipped with little ability to stop the process. As more and more coins were clipped, the face value of the existing body of coins came into question, raising transaction costs. By 1696 over 50 per cent of the precious metal content of the coinage was removed.[14]

This problem becomes even more difficult to solve in a case where there are two precious metals used for money. While England used both gold and silver in the 1690s, it was the silver coin that was being clipped. This was due to the ratio of gold to silver being upset by the high Mint price of gold and the high bullion price of silver. Though this is a simple problem to grasp theoretically, it again is difficult to solve in practice.

In 1696 England was at war with France. The war was largely fought on the Continent, and King William III and his armies required a constant flow of remittances from London. This created arbitrage opportunities. As the specie prices rose and fell on the international bullion markets, individuals could melt down clippings and sell them abroad for money if the price disparity were great enough. An example in the 1690s would be to clip silver coin, melt it into bullion and sell it on the Continent for gold coin, where silver fetched a higher price than in England. This gold coin would then be shipped back to England where the Royal Mint was paying a higher price for gold than other countries. This gold would be sold to the Mint for silver money and the arbitrageur would make a profit. The result would be a drain of silver and an oversupply of gold.

The bimetallic specie standard requires that the mint price of specie and the bullion market price of specie of both silver and gold should be equal or sufficiently close that transaction and transport costs eliminate all arbitrage profits. If this delicate balance was disturbed between the market to Mint price and the price ratio of silver to gold, it could result in the coined currency being altered for profit making purposes (that is, if gold's mint price rises and silver's bullion price rises, this would result in gold flowing into the mint and being coined and silver coinage leaving circulation to be sold on the bullion markets). This would typically involve clipping the coin (or in extreme cases actually fully melting down coins), thereby debasing the monetary standard. Such a scenario would

14. Jones, *War and economy in the age of William III and Marlborough*.

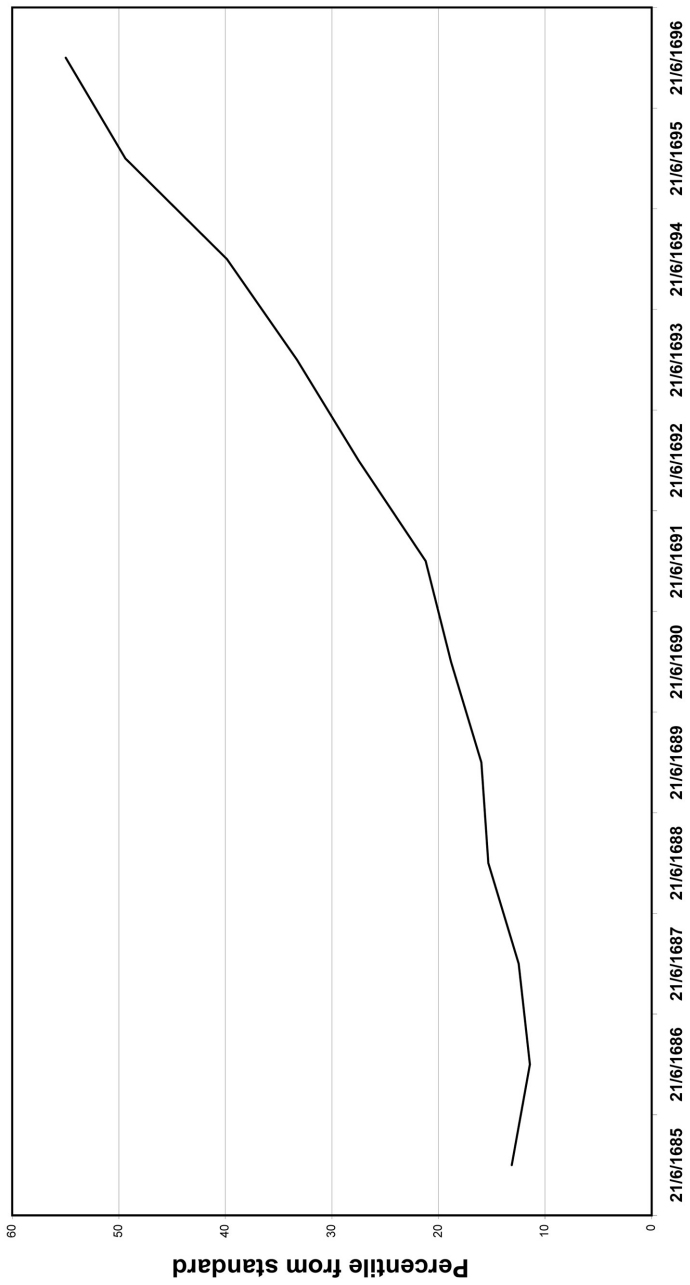

Figure 1: Deficiency of silver metal content.

have debilitating results for the economy, resulting from rising transaction costs and reduced liquidity as the face value of the coin came into question and more specie left the monetary base.[15]

The coinage problems in 1696 provide an example of this type of imbalance. Dutch silver had a higher bullion price than the English Royal Mint's price for silver. This caused silver to flow out of England into Holland to gain the arbitrage profit. England, on the other hand, had a very high mint price for gold. Continental gold bullion (paid to the English sellers for their silver bullion) was imported into England and sold to the Royal Mint. The result of this was that silver coinage became scarce and gold coinage became plentiful.

Thus there was an added incentive to clip the silver coin and export it as bullion abroad. Clipping the coin resulted in a problem for the economy at large as it undermined the face value of the coin, increasing transaction costs of doing business. Second, it was debilitating to the collection of taxes to fund the war, as remittances required full-weight (unclipped) coin. William Lowndes in his submission to Parliament on the state of the coin in England found that the weight of the coin entering the Treasury from tax collection was almost half what it should have been. As seen in Figures 1, 2 and 3, the fiscal situation was quite poor. As England exported more specie to pay remittances and incurred more foreign denominated debt the economy came under greater and greater stress.

The corruption of the coinage made covering the cost of remittances extremely difficult.[16] The problem of the coin rapidly became not just economic but one of military logistics, as funds to supply William's army were being slowed by monetary constraints in England. The war with Louis XIV was at a stalemate: any weakness, financial or otherwise, could result in the Anglo-Dutch alliance being defeated. William could not afford this and the Commission's brief was to find a rapid solution to the problem.

Clipped coinage and silver outflows together created a liquidity problem for the economy. As Thomas Sargent and François Velde, and Angela Redish have found, until the advent of the steam press and low cost methods of coin and paper money production, small change was a scarce commodity.[17] The silver outflow only made this problem worse in England. Between 1694 and 1696, silver's bullion price rose, resulting in silver coins being clipped and the clippings melted and sold on the

15. For further information on this monetary system see Angela Redish, *Bimetallism: an economic and historical analysis* (Cambridge, 2000).
16. Lowndes, *Report containing an essay for the amendment of the silver coins*, p.87-90.
17. Sargent and Velde, *The Big problem of small change* (Princeton, NJ, 2002); and Redish, *Bimetallism*.

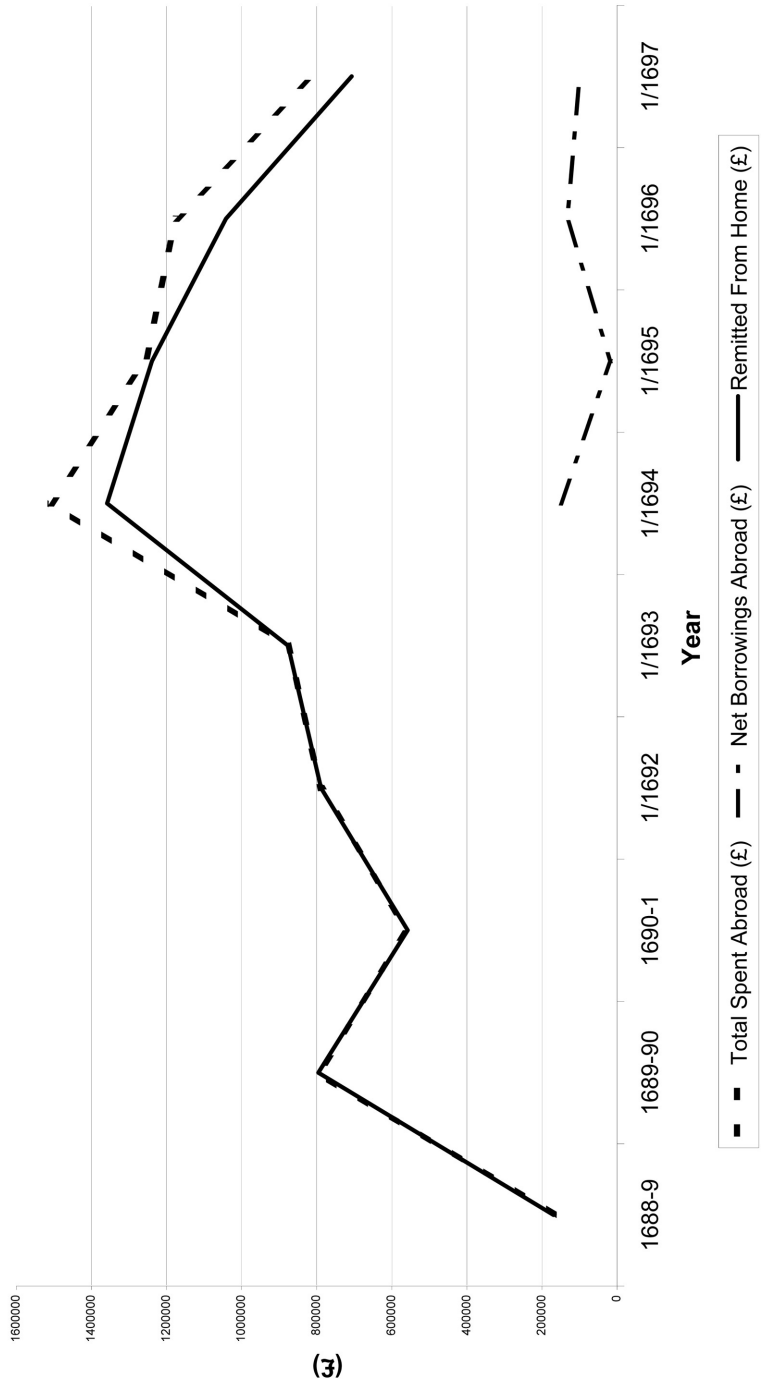

Figure 2: English remittances to troops and allies abroad, 1688-1697.

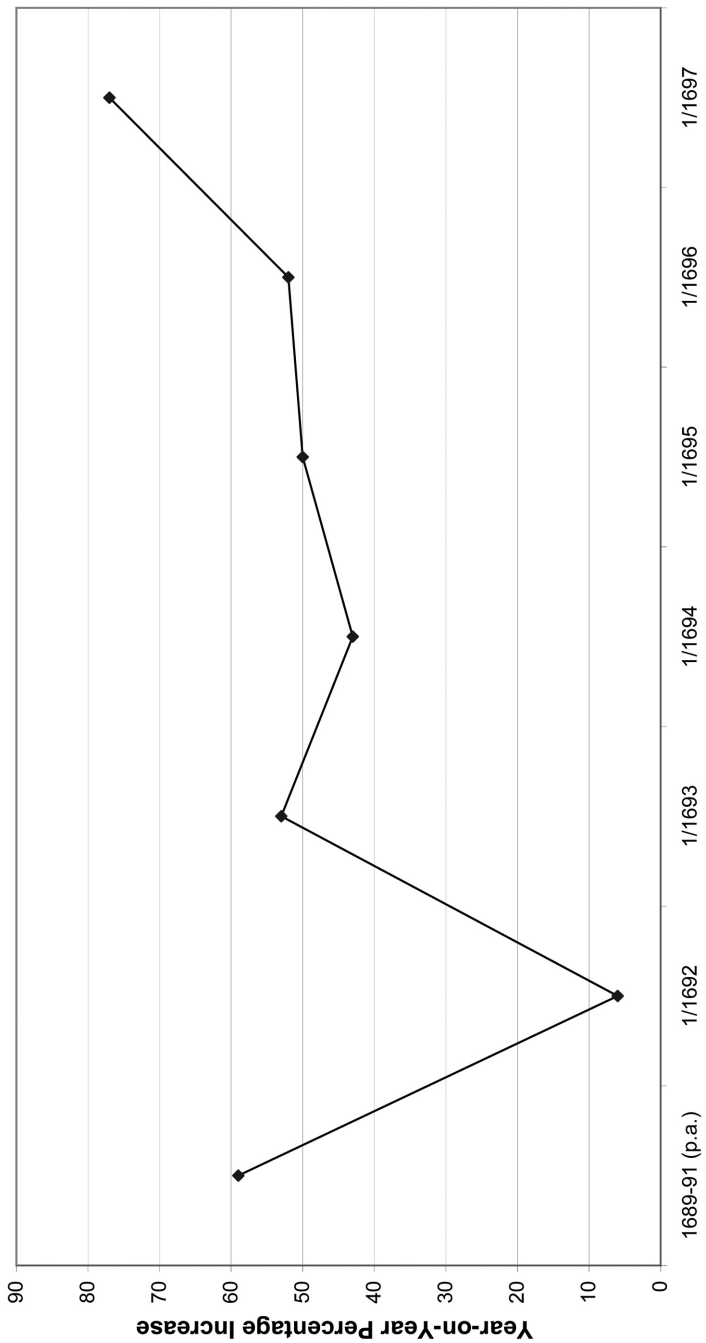

Figure 3: Borrowings.

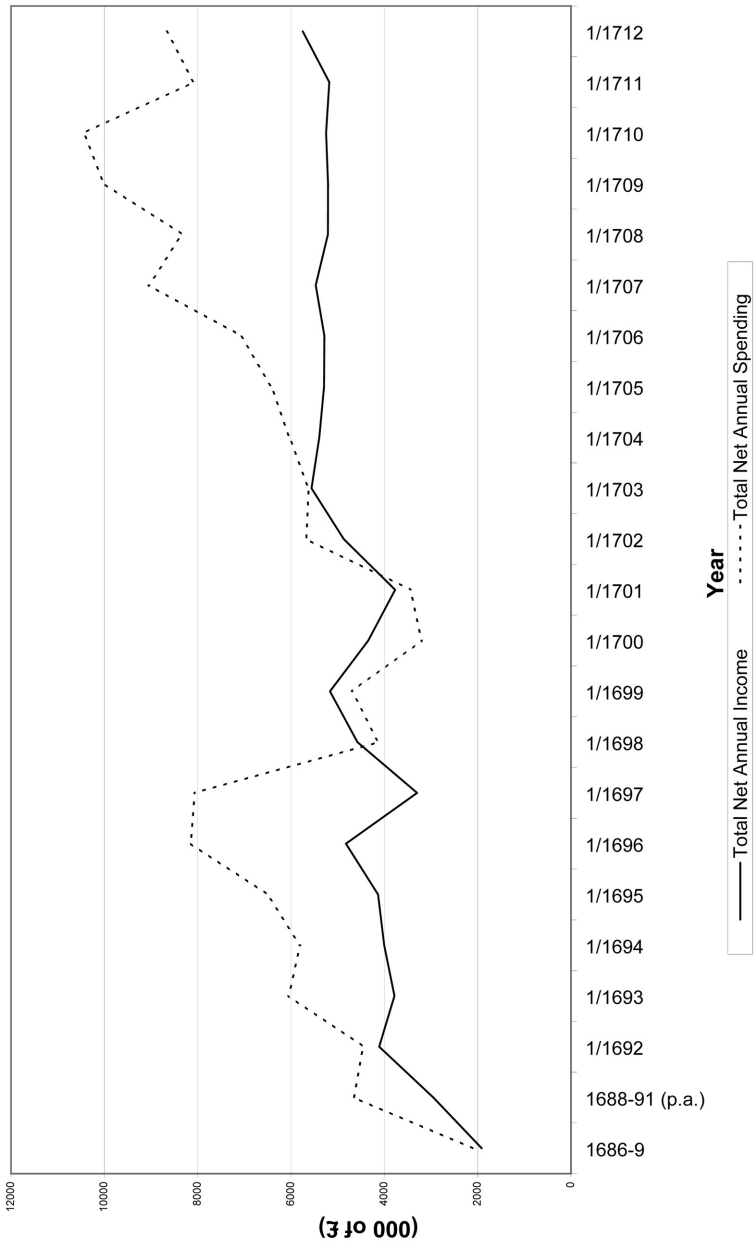

Figure 4: Government income and expenditure.

bullion market. As this process of clipping expanded, the quantity of small denomination coins was reduced (both in the sense that they were lighter post clipping, and because more and more of them were being melted outright into bullion), and a liquidity problem emerged. Sargent and Velde state that the liquidity problem at the small-denomination end of the market increased transaction costs and made transactions between individuals more difficult.

The question of the Recoinage was framed within this economic context. The Commission existed to find a solution to a problem that was obviously becoming an economic, political and military liability. Money to most persons (and Locke states this explicitly in *Some considerations of the consequences of the lowering of interest, and raising the value of money* (1692)) was silver coin. Gold was also in circulation but as a high denomination coin (30s. in mid-1695) it was used by few individuals, similar to a €500 note today.[18] In order to find a solution to the looming remittance problem and the liquidity crisis facing the economy, Lowndes, Locke, Newton, Davenant and others were asked to find a quick method of correction.

The proposals varied greatly. Within the structure of a specie standard, one possibility was to change the weight of the coin by increasing or decreasing metal content. A second potential solution was to change the face value of the coin and maintain the present metal content. Locke desired to bring the coinage back to its original face value and metal content. This was consistent with his social contract philosophy – the state had an obligation to maintain property, and this property included coinage. Lowndes proposed a considerable devaluation as a method of finding a rapid solution. Davenant, drawing on his experience as an economic policymaker as one of the Commissioners for Excise and his expertise in political arithmetic, was behind the idea of maintaining the status quo and supporting the expansion of England's credit system. In his two manuscripts, 'A memorial concerning the coyn of England' (1695) and 'A memoriall concerning creditt' (1696), which were rediscovered and edited by Abbot Payson Usher in 1942, Davenant outlines the idea of an economy that does not require a perfectly functioning specie system to survive. In doing so, Davenant provides a view of the beginnings of the Financial Revolution in late seventeenth-century England, and in this description he outlines the importance of credit in the monetary system. His input into the policy discussion on Recoinage was not accepted, but it enriched the debate and confirmed his position as an important contributor to the origins of the Classical School of Economics.[19]

18. See Sargent and Velde, *The Big problem of small change*, for more on this topic.
19. To quote Keynes: '"The classical Economists" was a name invented by Marx to cover

The specie-focused policy – the debate between Locke & Lowndes

The position put forth by Lowndes, speaking on the behalf of Treasury, was that devaluation of the coin was by far the best course of action for the Crown, maintaining the face value of the coin but establishing a much lower precious metal content. The breakdown, due to clipping, of the linkage between the intrinsic and extrinsic values of the coin is at the heart of the problems facing England's money in the 1690s. Lowndes's proposal did attempt to correct this problem, and by bringing the face value into line with the current (much reduced) metal content by law he expected that the problem of silver outflows and gold inflows to stop.

Lowndes sets out his ideas and those of the Treasury principally in his *Report* (dated 12 September 1695).[20] The *Report*, which argued its case in part by offering a history of English currency since the time of William the Conqueror, drew the conclusion that the English silver coinage should be devalued by 25 per cent. The nominal value (that is, extrinsic value) of the Crown piece would be raised from 5s. to 6s. 3d. and all other silver coinage in proportion. As silver coins would now have a higher face value, or Mint price, the incentive to sell silver bullion would be eliminated. This was a course of action that would solve some of the immediate problems facing the Crown, but not the long-term questions, such as the bimetallic ratio.

Lowndes began his discussion by stating that the standard fineness of the coin should be maintained. This statement prepares the ground for his solution of devaluation. The devaluation would be considered sizeable even by modern standards. He explains his rationale in this way:

Ricardo and James Mill and their *predecessors*, that is to say for the founders of the theory which culminated in the Ricardian economics. I have become accustomed, perhaps perpetrating a solecism, to include in "the classical school" the *followers* of Ricardo, those, that is to say, who adopted and perfected the theory of the Ricardian economics, including (for example) J. S. Mill, Edgeworth and Prof. Pigou' (John Maynard Keynes, *The General theory of employment, interest, and money* (New York, 1936), p.3) [original emphasis].

20. Research by Patrick Kelly ('General introduction', in *Locke on money*) indicates that the Chancellor of the Exchequer at the time, Charles Montague, was responsible for commissioning this work. Montague was Chancellor for the entire Recoinage and was the sponsor of the Recoinage Acts in Parliament. The basis for this assertion is the similarity of the Lowndes report with the Fourteen Resolutions of the Scobell Committee. Montague was the moving spirit behind these points and a fervent supporter of devaluation; he attempted to press for a resolution of Parliament in spring 1695 with the support of Godolphin. The political machinations of the time, most especially the desire of the king to maintain the monetary standard, and the price of reconciliation between the Montague and Wharton faction and the Shrewsbury and Somers faction following a leadership challenge, meant that the devaluation proposal had to be abandoned.

> The Value of the Silver in the Coin ought to be Raised to the Foot to Six Shillings Three Pence in every Crown, because the Price of Standard Silver is Bullion is Risen (from divers necessary and unnecessary Causes, producing at length a great scarcity thereof in *England*) to Six Shillings Five Pence an Ounce: This Reason (which I humbly conceive will appear irrefragable) is grounded chiefly upon a Truth so Apparent, that it may well be compared to an Axiom even in Mathematical Reasoning, to wit, *That whensoever the Extrinsick Value of Silver in the Coin had been, or shall be less than the price of Silver in Bullion, the Coin hath been, and will be Melted down*. [original emphasis][21]

Despite the logical position that if the price of bullion is higher than the face value of the coin, bullion will be exported (be it in the form of clippings from coins or in bars of silver) his devaluation was too radical for the Parliament to adopt.[22] The problem was that Lowndes's plan would have resulted in the removal of silver from the monetary system, as there were no provisions in his plans to alter the gold to silver ratio or to reduce the fineness of the specie. Silver was considered to be the true currency of England; gold was secondary.

There were errors in Lowndes's analysis of the benefits of the devaluation of the silver currency. One of the most striking of these errors, and, interestingly, one that continues to this day, was that he viewed devaluation as a panacea for international payments problems. Lowndes stated: 'It is hoped that the Exchange to *Holland*, (which by the way had risen a little of late) may by the Success of some good Designs on Foot (though the War should continue) be kept at a stand, at least from falling much lower.'[23] He further defended his position by stating that there was a

21. Lowndes, *Report containing an essay for the amendment of the silver coins*, p.38.
22. The question of its reasonableness as a monetary policy must also be addressed. Lowndes's proposal was effectively a devaluation of the currency. As modern economists are aware, the policy of devaluation has long-run negative welfare effects, even if there are some positive effects to creating a temporary, artificial competitive advantage. Lowndes accepted that a *de facto* devaluation of Sterling had occurred as a result of the loss of silver content of coins in circulation through clipping. Horsefield, *British monetary experiments*, and Li, *The Great Recoinage*, both address this question within the context of financial instruments and policy debate. The alternative, to restore the silver content of the currency to face value, would set in motion a process of deflation. Deflation also has welfare implications. In welfare terms, a devaluation typically results in domestic inflation, improved short-run external competitiveness, and an increase in the debt burden on firms and individuals that have borrowed in foreign currency. Inflation results in the decrease in the burdens on domestic currency borrowers at the expense of lenders. Those that hold foreign currency loans are placed under extreme stress and may be faced with the need to restructure debt or default. The impact is that it benefits domestic borrowers. Following a deflationary course of action benefits lenders at the cost of borrowers. Deflation also dampens consumption and begins to encourage a vicious cycle of thrift that slows credit and economic growth. Such welfare considerations were not mentioned in such clear terms but the relative impact of the state of the coin was a cause of concern for lenders. Davenant expands this discussion to include liquidity considerations.
23. Lowndes, *Report containing an essay for the amendment of the silver coins*, p.72-73.

distinct need for a reliable base of specie for the smooth running of the domestic economy. Though devaluations had been used in the past, the scale of the devaluation in the Lowndes proposal was radical, in the sense that a 25 per cent devaluation was unprecedented. But his *Report* was also insightful, in that it provided a corpus of monetary history of England to inform his side of the debate. Locke worked diligently to discredit the proposal, and eventually won the day.

Locke and Lowndes shared a common vision despite their different approaches to the recoinage; they both saw silver as the true money of England and gold as a distant second. They also both believed that the monetary system needed to be grounded in specie.

Locke felt that since silver was paramount, it was the link between the intrinsic and extrinsic values of the coin that required the greatest defence. This reflects his understanding of the currency system both philosophically and empirically. He was resolutely against the idea of devaluation and had powerful support from King William as well as friends such as Lord Somers and Trumbell. (Somers was one of the principal members of the Whig administration and an ardent opponent of the devaluation proposal put forward by Lowndes.) Locke was also driven by his ideas on property and social contract. For Locke, the state had a responsibility to its citizens to provide a sound currency. In debasing the currency, the state would effectively renege on its responsibility to ensure that property (which was defined as money in this situation) be maintained to the standard that the citizenry expected, that is, its true weight and measure. The state's role in the production of money was to issue a stamp of value that served at the same time as a statement guaranteeing that the extrinsic and intrinsic value of the coin coincided with what the Royal Mint specified in production. The state ensured that the silver content of the coin was equal to its face value; Locke therefore felt that the debased coin must be returned to its original intrinsic value, as that was the promise made by the stamp of value. This entailed recoining according to the existing standard.

Locke apparently had difficulty reconciling the Guinea situation with contemporary problems of the *de facto* bimetallic currency. The *de jure* currency of England was silver. Locke approaches this problem from the point of view that *only* silver exists as legal tender. This complicates his analysis and causes him to reject the interplay between gold and silver in international markets.[24]

Arbitrage opportunities created by the war had allowed for a complex market to develop between silver, gold and bills of exchange. It was clear that silver was leaving the country at an alarming rate. Lacking in Locke's

24. Kelly, 'General introduction', in *Locke on money*.

analysis was the price-specie-flow mechanism: the price-specie-flow-mechanism is a long-run adjustment mechanism for the effects of specie exports and imports. An excess of imported goods results in specie exports in the short run. This loss of specie causes the money supply of the country to be reduced. The reduced money supply causes a reduction in the price level. This conclusion follows from an early version of Quantity Theory of Money. The theory had its origin in the Spanish authors in the mid-1500s and the School of Salamanca, so would have been readily accessible in the late seventeenth century.[25]

The Quantity Theory[26] holds that with a lower quantity of money, consumption will be reduced (given that money supply must equal money demand), but with unchanged levels of output of goods and services prices are lower. The reduction of prices as a result of the outflow of specie is the key to the long-run adjustment mechanism. The lower prices subsequently result in the increase in exports, as the home country gains a competitive price advantage. Additionally, there will be a reduction in the level of imports as they become less competitive vis-à-vis domestically produced output. With the combination of cheaper domestic goods and more expensive imports (reducing demand), the result was less foreign exchange demanded at each spot rate of foreign exchange. This system would bring about the natural adjustment of a country's prices level and specie levels as a result of specie imports and exports.[27] Though Locke did understand the concept of the Quantity Theory of Money he did not link it to the price-specie-flow mechanism. Such a link would not be made until Richard Cantillon's *Essai sur la nature du commerce en général* (1755; composed between 1728 and 1730) and David Hume's *Political discourses* (1752).[28] Implementation of this theory would have been revolutionary in the late seventeenth century since it represented a stark departure from the Balance of Trade theory that specie inflows via a constant balance of payment surplus were desirable.

Locke's economic epistemology is another potential pitfall in his analysis. When Locke expanded upon his position that the coin should be restored to its original state at the expense of the public he made clear that silver was the true currency of England:

25. See Bernard W. Dempsey, 'The historical emergence of Quantity Theory', *Quarterly journal of economics* 50:1 (1935), p.174-84; and Earl J. Hamilton, *American treasure and the price revolution in Spain, 1501-1650* (Cambridge, MA, 1934) for more discussion of the formation of the Quantity Theory. On Locke's understanding of the theory, see Kelly, 'General introduction', in *Locke on money*, vol.1, p.84-86.
26. Here described in modern terms of MV = PY [money supply × the velocity of money = price level × national output (GDP)].
27. Charles Poor Kindleberger, *International economics*, 3rd edn (Homewood, IL, 1963).
28. Murphy, *The Genesis of macroeconomics*, p.89, 105-112.

> *Money* is the *measure* of Commerce, and of the rate of everything, and therefore *ought to be kept (as all other measures) as steady and invariable as may be*. But this cannot be, if your *Money* be made *of two Metals*, whose proportion, and consequently whose price, constantly varies in respect of one another. *Silver*, for many Reasons, is the *fittest* of all Metals to be this measure, and therefore generally made use of for Money. But then it is very unfit and inconvenient, that *Gold*, or any other metal, should be made current Legal Money, at a standing settled Rate.[29] [original emphasis]

Locke had decided that the best of course of action for the government was to maintain the standard of money and restore the clipped and worn money to its original status. The maintenance of parity between the seal and the actual intrinsic content was the key to running a viable monetary system, as Locke emphasised:

> Only this I will confidently affirm, *That it is the Interest of every Country, that all current Money of it should be of one and the same Metal; That the several Species should be all of the same Alloy, and none of a baser mixture: And that the Standard once thus settled, should be Inviolably and Immutably kept to perpetuity*. For whenever that is alter'd upon what pretence soever, the Publick will lose by it.[30] [original emphasis]

The focus on the Scholastic concept of intrinsic value was vitally important to Locke's understanding of money. Intrinsic value is a passive power, a quality which enables one object to affect another, whereas exchange value is a relative quality and can only be considered secondary.[31]

Money exists through common consent; it is part of that compact whereby society has allowed itself to be *regulated* by the law of nature. The maintenance of money's extrinsic and intrinsic value is part of that regulation. This is not a literal contract or in any way explicit, but a tacit agreement. As Kelly observes:

> Consent, for Locke, is concurrence in a mutually beneficial course of action, arising as it were in the form of spontaneous intellectual assent once the advantages of an arrangement become apparent. In the *Second Treatise* men consent to the adoption of money, since by permitting the accumulation of the surplus product and facilitating the division of labour money makes possible a more advanced standard of living.[32]

29. Locke, *Some considerations*, in *Locke on money*, vol.1, p.326.
30. Locke, *Some considerations*, p.329.
31. To look at it from the point of view of pure Scholastic thought, the *valor impositus* on silver comes from its function as the medium of exchange; the *valor intrinsicus* of money is the product of the common consent of all to acknowledge this medium of barter or exchange universally. Locke firmly plants himself in the category of a neo-scholastic natural law theorist by embracing this epistemological construct.
32. Kelly, 'General introduction', in *Locke on money*, vol.1, p.87-88.

Locke's understanding of money is only part of his approach to the Recoinage. While Lowndes presents the historically proven and traditional policy option of devaluation (though on a scale never attempted before, which was the ultimate downfall of his proposal), Locke abandons this familiar and somewhat pragmatic approach. Locke differs from Davenant, however, in so far as he does not understand the importance of credit to the English monetary system and consequently to the economy. In addition, Locke's methodology is highly distinctive. Economics, for Locke, exists as part of the field of *praktikê* and not as part of a Baconian experimental science. *Praktikê* he defined in the *Essay* as

> The Skill of Right applying our own Powers and Actions, for the Attainment of Things good and useful. The most considerable under this Head, is *Ethicks*, which is the seeking out those Rules, and Measures of humane Actions, which lead to Happiness, and the means to practise them. The end of this is not bare Speculation, and the Knowledge of Truth; but Right, and a Conduct suitable to it.[33]

Davenant's analysis, however, is the product of 'Political Arithmetick', a fundamentally different epistemological method. Davenant viewed things from a Baconian, pragmatic perspective. He followed the empirical tradition that he had learned from the writings of Sir William Petty (who is frequently cited in Davenant's published works) but he was also willing to innovate in science, even to introduce intellectual inconsistencies, subject to the pragmatic needs of the moment, something that was made clear during his time as a Commissioner of Excise. This is not to deny the empiricism that is the cornerstone of Locke's thought, but this empiricism is applied in the context of an understanding of economic issues which retains a more traditional mercantilist and scholastic character.

Locke's proposal won out, therefore maintaining the *de facto* bimetallic system and bringing the coin back to full weight through the recoinage. The system remained legally bimetallic but over time market forces and transactions preference caused a shift from silver to gold as being the dominant monetary coin, something that none of the participants expected. It was left to Newton to compensate for this shift during his various roles at the Mint.[34] The problem was created by Locke's resolute position that the linkages between what money passes for in the market and what the silver content of that money was would ensure the

33. Locke, *An Essay concerning human understanding*, IV.xxi.3 (p.720).
34. This was because Newton was the only member of the advisory body to be placed in a position where he could significantly alter monetary affairs. Newton was made Warden in 1696 and Master in 1700. As Master of the Mint he changed the price of the guinea many times over his tenure to stop the outflow of silver coin.

functioning of England's monetary system. His final thoughts related to the devaluation supported by Lowndes's proposal, where he predicted that Lowndes's recommendation would result in the complete elimination of all the milled money of England as well as the already corrupted stamped money.

A swift solution to the problem of recoinage was extremely important to King William, as political and military considerations were pressing. The decision was made to recoin at the existing legal standard. The advice of the Lords close to the king was that recoinage should not be undertaken as a royal decree but under the auspices of Parliament. In the king's speech on 23 November 1695, he mentioned the ill state of the coin and the need to expedite a solution to this problem, though he gave no indication of the precise plan.[35] The Commons began to formulate a general position on recoinage during the month of December. By the 10th of December a resolution was proposed that followed the spirit of Locke's thinking, if not all of his provisions.

In January 1696, Godolphin took over the Commons' proposal and the Earl of Rochester essentially created a new bill.[36] The first coinage bill was passed on 13 January 1696: the 'Act for Remedying the Ill State of the Coin of the Kingdom' took effect on 17 January 1696.[37] It was decided that by the 4th of May clipped coins would cease to be considered legal tender, and by the 24th of June they would no longer be acceptable as a form of payment for taxes.

The proposals of both Locke and Lowndes had explicitly ignored the problem of gold and the bimetallic question. The action or rather inaction of Parliament and the ensuing confusion over the gold situation made this issue even plainer. In a letter signed 22 September 1698, Locke wrote to the Lords Justices as a Commissioner of Trade, imploring the Government to solve the continuing problem of guineas which he had neglected in his proposal on recoining silver. The recommendation was to lower the guinea to 21s. 6d. from the current price of 22s, although this was not enacted until 1699 on the advice of Newton, when the Bank of England refused guineas at 22s.

Following this painful monetary contraction, Newton had come to the understanding that as long as the price of silver bullion was higher than that of the legal rate of the coinage there would be no natural inflow of silver into the Mint, because it would be more profitable to sell silver on the bullion market. According to Ming-Hsun Li:

35. Henry Horwitz, *Parliament, policy and politics in the reign of William III*.
36. Rose, *England in the 1690s: revolution, religion and war*. Rochester was another powerful member of the Tories.
37. Li, *The Great Recoinage*.

> It appears that gold had been over-valued all along since the recoinage of 1696-1699 [....] Although the price of guineas was reduced to 21s 6d apiece during 1699-1717 and to 21s thereafter, the overvaluation of gold still existed in England up to 1760 at least. In 1702 and 1717 Newton had observed that while a guinea was only worth 20s 5d to 20s 6d on the European Continent, it was accepted in England at no less than 21s 6d, the difference being 4 to 5 per cent. It was therefore most advantageous to ship gold to England and to bring it to the mint to be coined.[38]

The further instructions left to the Commons by King William and Lord Somers were to consider the price of guineas, whose price fluctuations were already resulting in exchange rate difficulties and a scarcity of small denomination coinage.[39] At 30s. per guinea and with the price rising rapidly there was an acute need for the over-valuation of gold to be resolved. 'The Act for taking off the Obligation and Incouragement for Coining Guineas for a certain time therein mentioned' (5 March 1696) addressed the problem by immediately lowering the price of guineas from 28s. to 26s., subsequently to 25s. and finally to 22s.

Ultimately, Locke's errors and the confusion over the future value of guineas were problems solved by Newton. The outflow of silver coins continued after the recoinage was completed, while gold inflows and the coining of gold increased. The value of the guinea to the public was 21s. 6d. and it was received at that rate for all payments. McCulloch suggests that

> It appears, however, from the best attainable information, that this valuation of 21s. 6d. was really equivalent to a premium of 10d. in favour of the Guinea, it being worth only about 20s. 8d. of the new Coins. And in consequence of this marked, though unintentional preference of Gold, it was used, to the exclusion of silver, in all considerable payments; while the new Coins of the latter, being not only under-valued but in excess, immediately began to be exported.[40]

The premium on bullion still drew silver out of the country and the ratio between silver and gold had not been modified sufficiently to ensure the retention of a bimetallic system. Newton, unlike Locke, felt that passing

38. Li, *The Great Recoinage*, p.167. Future commentators stated that the real problem was a lack of devaluation of silver. The reduction in the price of the guinea was politically problematic since it was disadvantageous to important parts of the State apparatus, due to the main holders of gold coin being the Government and the Bank of England. In addition England was engaged in several wars between Spain and France between 1702 and 1721, which further complicated this monetary correction. 'Both [Richard] Cantillon and [John] Conduit suggest that the right course to take should have been a devaluation of the silver standard. The latter recommended that the devaluation be about 4 per cent' (Li, *The Great Recoinage*, p.172).
39. Horwitz, *Parliament, policy and politics in the Reign of William III*.
40. McCulloch, 'Note on the re-coinage of 1696-1699', p.263-64.

the clipped silver coin by weight was an impractical approach. His position fell between those of Locke and Lowndes: he proposed that the coin be brought back to its mandated full weight in stages.

By 1702, 21s. 6d. was an over-valuation of 9d. (3.49 per cent) and had resulted in a surplus of gold coinage over the previous thirteen years.[41] Newton realised the mistakes of the past and to rectify the situation he made a final decision on the future of Sterling late in his tenure at the Mint – a Proclamation issued on the reduction of the value of the guinea from 21s. 6d. to 21s. (a fall of 2.32 per cent), and a final gold-to-silver ratio decided at 1:15.212 gold to silver. Still, Newton's final intervention to correct the errors of 1696 was for nought. There was still an overvaluation of the guinea of 4d. or 1.58 per cent. Sterling became *de facto* mono-metallic from 1717 to 1816, with the silver stock of coinage becoming entirely secondary coins, well-worn and of little importance.[42] The Earl of Liverpool legalised this situation with the recoinage at the close of the eighteenth century.

Davenant and a financial-instrument based point of view

Charles Davenant, an advanced economic thinker and astute practitioner of the method of political arithmetic, had many ideas on recoinage and monetary theory that deserve exploration. His relative neglect in the context of the debate on recoinage has been due to a number of factors. Waddell has commented on Davenant's reputation as a Tory 'pen for hire' and his extreme desire to regain the patronage and power he lost with the end of the Stuart monarchy. This has traditionally caused some concern about his integrity.[43]

Davenant's two statements to the Commission were not printed at the time, and the main trace of the debate in his better-known works appears in his continued references to the Recoinage and insistence that it was a detrimental decision for many years after 1696. Though Davenant's logic is not always watertight, he is still able to demonstrate to the reader clear conclusions, based on a method of analysis that helps to draw them together.

Unlike Lowndes, Davenant approached the questions of the Great Recoinage from the point of view of deductive science. Davenant first set out his theories on money and credit and then proceeded to provide an answer to the questions that were posed to him by Lord Godolphin. This section of the essay will address Davenant's background and will set out

41. Li, *The Great Recoinage*.
42. McCulloch, 'Note on the re-coinage of 1696-1699', p.264.
43. D. Waddell, 'Charles Davenant (1656-1714) – a biographical sketch', *Economic history review* 11:2 (1958), p.283.

his monetary theories and their influence on his approach to the problem of recoinage.

Davenant, it is important to note, was from the first against the idea of the recoinage and felt that devaluation would only result in inflation and a worsening of the exchange rate with Holland. Unlike both Locke and Lowndes, he was of the mind that the recoinage should be delayed as long as possible, at least until the completion of the war, and should under no circumstances be rectified by devaluation.[44] His most pressing concern was that the war with France made England vulnerable; to engage in such a risky action as a comprehensive recoinage would only result in disaster. He believed that as the problem had existed for so long a delay until the end of the war would not significantly exacerbate the situation. The central precept to which Davenant continuously returned was the need for a base of money in which there was confidence, but the draft horse of the monetary system of England was to be found, he insisted, in credit, not bullion. Credit was more flexible and able to absorb real and monetary sector shocks better than specie.

Davenant was one of the bridging individuals in the history of economic thought. He was a student of the school of 'Political Arithmetick'. This was a method of analysis designed to assist in the running of government and the creation of policy. Davenant subscribed to the philosophy of Sir William Petty, whose *Political Arithmetick* appeared posthumously in in 1690 (only five years prior to Davenant's writing on the state of the coinage and money of England), after having been developed and practised much earlier in the 1670s.[45]

Davenant was a civil servant during the period of 1686 to 1714, though this was not a continuous position. The law had never provided him with a sufficient income so that in 1678 he became a Commissioner of Excise.[46] Davenant was elected MP during the reign of James II for St Ives in Cornwall in 1685. He was later returned to Parliament as MP for Great Bedwyn in 1698 and again in 1700.

The Glorious Revolution of 1688 resulted in his removal from the Commissioners of Excise. As his career in government came to a dramatic halt his own personal fortune, derived from his father, Sir William Davenant, Poet Laureate and general in the army of Charles I,

44. Charles Davenant, 'A memorial concerning the coyn of England' (1695), in *Two manuscripts by Charles Davenant*, ed. Abbott Payson Usher (Baltimore, MD, 1942), p.28-29 and 62-63.
45. The most notable exercise in this mathematical method came in the Davenant-King Law of Demand, which was one of the first formulations of the law of demand in the history of economic thought.
46. Julian Hoppit, 'Davenant, Charles (1656-1714)', in *Oxford dictionary of national biography*; D. A. G. Waddell, 'The career and writings of Charles Davenant (1656–1714)' (Doctoral dissertation, University of Oxford, 1954).

was obliterated. A personal loan of £30,000 made by Davenant (and two partners) to the Crown was defaulted on, resulting in monetary difficulties that plagued Davenant for the rest of his life.[47]

On the accession of Queen Anne in 1702, Davenant returned to political favour and negotiated through the Lord Treasurer Godolphin in 1703 a post as secretary on the Commission on the Union of Scotland and England and a diplomatic post in Frankfurt for his son Henry.[48] In June 1703 he obtained the lucrative position of Inspector-General of Exports and Imports. Davenant took this to be a position of advisor to the British Government on economic policy and his *Report to the commissioner for public accounts* (1712) includes a statement of the most economically favourable policies to develop trade and increase the wealth of the nation in addition to the comprehensive and well devised statistics developed by Davenant.

In his position as a policymaker in the 1680s Davenant distinguished himself as an economist. Though he took many of his ideas from figures like Petty, he advanced upon their methods of political arithmetic and modelling. Davenant designed his theories and policies around his circular model of wealth and trade, his theory of credit, and his statistical analysis of the *de facto* economy,[49] which will be elaborated below. As a practitioner he not only illustrated his ideas but also developed and refined them, ultimately using them to form economic policy and advice for England.[50]

Unlike Locke or Lowndes, Davenant saw money not as bullion but as credit.[51] One finds through inspection of Davenant's writings that, although he recognised the importance of accumulating specie as a concern of the state, he differed from the mercantilist view by arguing that this was not the principal aim of economic activity.[52] Davenant began his discussion with a statement that the position of public credit had consistently improved since 1667.[53] He further developed the credit

47. Hoppit, 'Davenant, Charles (1656-1714)'; Waddell, 'The career and writings of Charles Davenant (1656-1714)'.
48. Waddell, 'The career and writings of Charles Davenant (1656-1714)'.
49. Brewer, *The Sinews of power*, p.78.
50. Davenant's financial problems and political concerns resulted in a life-long friendship with James Brydges (the future first Duke of Chandos). This friendship would be an important part of his access to the government and involvement in policy decisions. See Godfrey Davies and Marjorie Scofield, 'Letters of Charles Davenant', *Huntington library quarterly* 4:3 (1941), p.309-42.
51. This is not immediately apparent from his works, where he tends to be less than consistent.
52. The main reason for his interest in specie may be a direct result of the economics of war, when gold and silver were the only medium of exchange (true even as recently as World War II).
53. An interesting note comes from his comment that trade between nations took place even in the absence of specie, an indication of the move of the economy towards a more fiat-based

system as a circulating system of flows, much like Sir William Petty's description,[54] but noted that there were failures preventing the circulation of credit throughout the whole of England.

Davenant, like Petty, considered money to be an important factor in the economic system and understood that lack of access to money, or for that matter credit, damaged the economy, led to unemployment and impaired the nation's productivity.[55] Credit was needed as trade expanded and England was exposed to competition from the rest of world. The core principles that guided Davenant's ideas came from an interpretation of money as something that is used as a means of exchange rather than as the definition of wealth. He made this point of view clear in the following statement:

> for gold and silver are the measure of wealth, all things [are] dear or cheap as that sort of wealth is wanted or abounding. And in all countries of the world where money is rare and scare, the product of the earth is cheap; as for instance, in Scotland, Ireland, the Northern Kingdoms, Germany and most parts of Asia and America [....][56]

Davenant's theory of money was steeped in the concept of monetary flows, originating through the wealth that trade provides (which he calls the foundation of credit). Money was part of the economy. It was the measure of the economy; it was a source of growth by providing a basis for credit, but contrary to the claims of Smith and others in their

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monetary system. He outlined that those who desire to charge high rates of interest are doing damage to the public good and to the government. Due to this failure of policy, the monetary system must be regulated in such a manner that the government finds it easy to gain access to credit and at a reasonable rate of interest.

54. Sir William Petty outlines his views on money and the circular flow of income model in his *Quantulumcunque concerning money* (1682) published in 1695. Petty's ideas, techniques and data are repeatedly cited by Davenant, elaborated upon and used as part of his arguments relating to trade and monetary policy as well as assisting in his work on the law of demand. See Murphy, *The Genesis of macroeconomics*, p.36-40, for a brief summary of Petty's monetary thought. On Davenant in comparison to Petty see Schumpeter, *History of economic analysis*, p.212-13; Luigi Cossa, *An Introduction to the study of political economy*, trans. Louis Dyer (London, 1893); John Creedy, 'On the King-Davenant "Law" of demand', *Scottish journal of political economy* 33:3 (1986), p.193-212; A. M. Endres, 'The functions of numerical data in the writings of Graunt, Petty, and Davenant', *History of political economy* 17:2 (1985), p.245-64; Endres, 'The King-Davenant "Law" in classical economics', *History of political economy* 19:4 (1987), p.621-38; Lars Magnusson, *Mercantilism: the shaping of an economic language* (London, 1994); Miles Ogborn, 'The capacities of the state: Charles Davenant and the management of the Excise, 1683-1698', *Journal of historical geography* 24:3 (1998), p.289-312; Stephen M. Stigler, 'Jevons on the King-Davenant Law of demand: a simple resolution of a historical puzzle', *History of political economy* 26:2 (1994), p.185-91; and Aspromourgos, *On the origins of classical economics*.

55. Murphy, *The Genesis of macroeconomics*, p.38-39.

56. Charles Davenant, *The Political and commercial works of that celebrated writer Charles D'Avenant, LL.D.*, ed. Sir Charles Whitworth, 5 vols (London, R. Horsfield *et al*., 1771), vol.1, p.160.

polemics against the Mercantilists, it was not the economy itself. Davenant took the idea of monetary flows and brought it to a new level by applying concepts based upon a theory formulated from observations and political arithmetic to outline feasible policy recommendations.

Money, to Davenant, was a tool of economic growth and a signal of stability. The use of economic factors (fiscal policy, monetary policy, currency, taxation) as tools in policy making was a giant leap from previous English authors in the direction of modern economics. Prior writers used money as the object of policy; the law was the agent and catalyst of change. Davenant went further – he used money and credit as the agent and catalyst of change for the objective of expanding output and employment. Davenant went beyond Petty by applying theory to reality directly, by trying to make a scientific study of the natural laws of the market and then to use these laws to change the final outcome of the market over time. By understanding the actual mechanisms that govern the economy he took a radical new step in policy making away from the earlier position of legally imposing order on 'disorder'. The old method of coinage laws and the proposal of Lowndes and Locke attempted to alter the monetary system without regard to the context within which it functioned. Davenant advocated using the forces of natural law to bring a more favourable order[57] on what he knew to be either an unfavourable order (high unemployment/low output) or legally induced 'disorder' (laws governing commerce distorting the market mechanism towards an inefficient outcome).

Though Davenant's work in its published form illustrates an astute mind, the place where his monetary ideas find their most coherent and powerful representation is in his unpublished manuscripts, 'A memorial concerning the coyn of England' (1695) and 'A memoriall concerning creditt' (1696). Davenant's work relies heavily on the use of biological analogy, a key aspect in the terminology of later authors in the description of the economy and the monetary system. His views on money and trade in the 'Coyn' manuscript show how Davenant understood the nature of a money economy and that money is not the wealth of the economy but only a part of the general system, yet an integral and necessary part of that system. In his comments on the problems with the specie money of England during the Nine Years' War he made an important connection between the actions of trade and the sustaining of a stable economy and political establishment:

57. Or to be more economically correct – Pareto Optimal equilibrium. There can exist multiple equilibria; one can be low unemployment with high output and the alternative equilibrium point can have high unemployment/low output. Both exist and both can be stable; it is just that one does not want to exist in the high unemployment/low output equilibrium.

> This Commerce of Money does not only arise from Trade but often from Warr, When a Prince has an Army to pay in Forreign Parts, that does require greater Summs then the Balance of Trade with that Countrey can answere, Trade and Money are in their Nature so mixed one with the other that it Seems Impossible to consider them apart with any Effect conducive to those Ends proposed by the Government
>
> Trade and Money are like Blood and Serum, which tho Different Juices, yet runn through the veines mingled together
>
> And this present Corruption of our Coyn is like a dangerous Ulcer in the Body Politick which is never to be thoroughly Cured by applying Remedies to the Part, but by mending the whole Mass of Blood which is corrupted.[58]

The basic idea of a price-specie-flow-mechanism is hinted at in the works of Davenant but not fully outlined or described. Davenant, though successful in splitting money from specie and in his descriptions of money substitutes, does not go so far as to develop this theory. In addition, he outlined the principal concerns and uses of money, although he does fall into some of the commonly held errors of his day. This may reflect some of his focus on practicality of application, something he developed during his time as a Commissioner for Excise.[59]

Davenant stated his monetary assumptions as his introduction to his response to Godolphin's questions on recoinage:

> That the Importers who cannot Satisfie their Ballance with Commodities must do it with Money or with Bullion
>
> That if the Merchant can get more by sending money or Bullion then Goods he will make his Returnes by Money or Bullion.
>
> That Gold and Silver tho. they are the measures of Trade are themselves but a Commodity
>
> That the Nation which is not Superior in Trade can never Sett the price upon Bullion [....]
>
> That whatever price any Countrey setts upon its own Coine it will be Esteemed with other Nations but at its Intrinsick value
>
> That in the Naturall Course of Trade each Commodity will find its price.[60]

Davenant illustrates the separation between the basic commodity concerns of specie flows and the overall economic well-being of the state, insofar as he does not see bullion movements as explicitly damaging:

> Tis true that gold and silver tho' they are the Measures of Trade, are themselves but a Commoditye, and may be Trafficted and exported, either Coined or uncoined like other Commodityes without any Damage to y^{e} publick.
>
> But this holds onely in Countreys which have means of inviting Bullion to

58. Davenant, 'A memorial concerning the coyn of England', in *Two manuscripts*, p.8.
59. Ogborn, 'The capacities of the state: Charles Davenant and the management of the Excise, 1683-1698'.
60. Davenant, 'A memorial concerning the coyn of England', in *Two manuscripts*, p.12-13.

> them, as well as occasions to carry it abroad, and cannot hold in that Countrey which carryes it out only to pay a dead loss, or a dead expence.[61]

Davenant stated that, despite all concerns, trade was still the most important aspect of the English economy. He made the important statement of the need for trade and that England existed as a 'price-taker': a small open economy in late seventeenth-century Europe. As he maintained: 'we are a Tradeing Nation, all our Interests are closely linked with the Interests of Trade. The product of our Land must be guided and ruled by our Forreign Commerce, Almost whatever our Soile produces must be valued here at the Price which the Luxury or Necessities of other Nations put upon it.'[62]

The question that Davenant attempted to address in his manuscript on 'Coyn' was whether the effects of an edict-driven change in the value of the coin would be felt by the economy of England. Davenant stated that this change would have no effect. He saw the adjustment as natural and near instantaneous, resulting in no disruption of the flow of trade. The intrinsic value of the specie would remain the same, an ounce for an ounce, whereas the change in the extrinsic value of the currency would be dealt with by changes in the prices of commodities. 'No man can buy by one valuation of Mony, and sell by another.'[63] He expanded:

> And since all these things are so necessary to the Being or well being of Life, they must be had at what ever Rate they Cost: Nor can Law Interpose in this Matter with any effect, for in the Naturall Course of Trade, Each Commodity will find it[']s Price.[64]

Davenant had a well-developed view of the market for capital, both physical and liquid, in addition to his hypotheses on the nature of specie flows. The rental rate of capital, or the price of that capital, was illustrated in a quite 'Classical' fashion. The idea of the tenant-landlord relationship as described by Davenant has much in common with Cantillon's view of the circular flow of income.[65] In addition to utilising his own calculations to make his point throughout this section of 'Coyn', Davenant clearly illustrated the rationale behind the hiring of capital and the letting of capital, which was similar to the Marshallian descrip-

61. Davenant, 'A memorial concerning the coyn of England', p.39.
62. Davenant, 'A memorial concerning the coyn of England', p.17.
63. Davenant, 'A memorial concerning the coyn of England', p.21.
64. Davenant, 'A memorial concerning the coyn of England', p.21.
65. This idea, with its extension to trade between nations, finds its clearest statement in 'Coyn': 'For as We have Observed before, The Commerce of Money by Exchange goes in a Circle, and a Debt in Flanders may be paid by Commodities sold in Turkey or in Spain. And if this Trade had proceeded in its usual Course, We might during this War have kept a great part of Our Money still in the Kingdome' (Davenant, 'A memorial concerning the coyn of England', p.58).

tion of investment. The only modern aspect lacking in his description of the functioning of the rental rate of capital was his exclusion of risk:

> In Letting Land for Rent, as in other Bargains the mut[u]al[l] worth of each, are compar'd together and Consider'd. The Tenant takes the Land because it brings forth such Commodities, as in the Markett will yield him such a price, wherewith to sustain himself and to Pay his Rent. The Landlord lets it because it yields such Commodities, and he thinks with such Rent to Maintain his usuall Port, and manner of Liveing.[66]

Davenant used this definition to illustrate that the rental price of capital cannot be dictated by law, most especially if that rate is below the market clearing equilibrium, as no individual will knowingly take a loss on their capital or produce even if the state attempts to compel them to do so by force. Should the state impose such controls it would be detrimental to the overall economy as it would precipitate a breakdown in the economic and legal contracts between tenants and landlords. This breakdown would spread from the real economy to the monetary economy, notably credit markets.

Credit is extremely important in Davenant's economics. He argues 'That the greatest part of Trade, both fforreigne and Domestick, is allwayes carryd on by Creditt'.[67] This position on the creation of credit was further developed by Davenant when he came to describe the state of English commerce, as the transactions were performed via credit and bills of exchange:

> as the publick deals with the people by giving Tallyes or Bank Bills, for Goods and Money, so the people deal among themselves by assigning or transferring to one another those or such like securityes, which have no existence but in Credit, publick or private by which the bulk of Trade is carryed on; The Species rarely Intervening; Just the same thing being practiced in Holland, and in severall States of Italy.
>
> These sort of securityes are already equall to the running Cash, and if the supplyes to be given hereafter consist (as tis likely they will) in Credit upon remote ffonds they will far surmount it and grow the governing Wealth of ye Kingdome. If soe, and that they continue to hold their present esteeme there is no reason to believe, but by their help the domestick Trade of the Nation may be carry'd on in whatsoever condition the Coyne remaine.[68]

In 'A memoriall concerning creditt', Davenant again provided a more developed look at his theory of credit than what is afforded in his later works. This piece has two very useful aspects for students of Davenant or of any late seventeenth-century monetary theorist – first, it provides a portrait of the functions of credit and money and, second, it includes an

66. Davenant, 'A memorial concerning the coyn of England', p.23.
67. Davenant, 'A memorial Concerning the Coyn of England', p.25.
68. Davenant, 'A memorial concerning the coyn of England', p.45.

invaluable description of the functioning of the wartime English monetary sector. The necessity of money (be it paper or specie) and credit in the economy was clearly stated by Davenant, and was similar to the view of money that Hume would later make in his *Political discourses* (1752).[69] Hume felt that money oils the wheels of commerce and that without it commerce would grind to a halt. Petty stated that it was the fat on the body-politick.[70] In his mention of the necessity of money and credit Davenant continued with this line of thought:

> If there should be a want of Species, and of Credit, there must happen a generall decay in the fforraigne Trade and Manufactures of the Kingdom. The spring and originall of all our Commerce abroad, arises from the Materialls that our soil produces, and those Commodityes which from thence are manufactured. If the stock of 30. Millions formerly running in Credit be much diminished, and if the species of mony be likewise wanting to carry on the Minuter business in ye Market, and for payment of labouring men and Artificers, the Manufactures of the Nation must stand still, and if We have not Goods to export, we must expect no Importation, but such as shall be destructive to us. Numbers of men, Industry, Advantagious situation, Good ports, skill in Maritime affaires, with a good Annuall Income from the Earth, are true and lasting Riches to a Country; But to put a Value upon all this, and to give life and motion to the whole, there must be a quick stock running among the people, and alwayes where that stock increases, the Nation growes strong and powerfull; and where it visibly decayes, that decay is generally attended wth publick Ruin.[71]

Davenant had bridged the gap between the 'Mercantilist' and 'Classical' world in this statement.[72] He later stated in his manuscript that the Government should not default on its loans, as this would undermine confidence in the credit of England.[73] If the public were to lose faith in the sustainability of the debt held by the State, then the entire system would 'sink all Sort of Credit, and with it[']s ruine, hazard the very being of the Government'.[74] This was similar to the predictions of modern

69. 'Money is not, properly speaking, one of the subjects of commerce; but only the instrument which men have agreed upon to facilitate the exchange of one commodity for another. 'Tis none of the wheels of trade: 'Tis the oil, which renders the motion of the wheels more smooth and easy.' David Hume, 'Of money', in *Political discourses* (Edinburgh, R. Fleming for A. Kincaid and A. Donaldson, 1752), p.41.
70. William Petty, 'Verbum sapienti' [1664], in *The Economic writings of Sir William Petty*, ed. Charles Henry Hull, 2 vols (Cambridge, 1899), vol.1, p.113. See also Desmedt, 'Money in the "Body-Politick" ', for further discussion.
71. Davenant, 'A memoriall concerning creditt', in *Two manuscripts*, p.72.
72. Davenant took a view that was different from most of his contemporaries. He felt that the economy was governed by natural law, and that to intervene in the economy would be a contravention of the natural order. This was a policy that later became the hallmark of Adam Smith.
73. Davenant, 'A memoriall concerning creditt', p.77-79.
74. Davenant, 'A memoriall concerning creditt', p.78.

macroeconomists with respect to unsustainable debt in developing countries (and developed countries as well). If there is a falter in confidence capital flight takes place. This results in a credit crunch that undermines the real economy as well as destroying the monetary sector.[75]

Davenant's final monetary innovation was his outline of how a money-substitute system would work in England, under the auspices of the early notes of credit and bills of exchange that initiated the development of the paper money system. As Davenant's concern at the time was the maintenance of the paper money system that flourished in wartime England, he outlined the functioning of that system. Seeing the specie standard slowly being corrupted over the 1690s, Davenant observed that economic activity continued due to the ability of financial instruments to provide liquidity and capital in the circumstances of a compromised, traditional specie system. Davenant's view of this new monetary system, which was to become the foundation of the Financial Revolution, is summed up as follows:

> To make those Credits pass Currently from hand to hand (and so become in the nature of a new Stock in the Nation, where with the People may trans-act their Bargaines) they must be Secured upon Solid and Substantiall Fonds, In the Same Manner for Debts hereafter to be contracted, Such Talleys as are proposed to go in Payment of the Army, the Fleet, Ordnance, Civil List or for Stores, or for repayment of Money acctually to be lent should be placed upon Such Fonds as will every Year Clear off the Interest, and a certaine proportion of the Principall. If Such Fonds can be found out and Sett afoot the Tallies Struck thereupon will be as so much new Stock in ye Kingdome and because they carry Interest with them, may perhaps in time be more esteemed then money it selfe, and if Tallies can obtaine their former Esteeme and value, Paper Credit of all kinds will revive of Course.[76]

Providing one of the earliest and clearest statements on the nature of paper money functioning in an economy, Davenant showed himself to be a master theorist. The interesting part of this statement on the monetary system is that Davenant described an empirical reality; paper credit became an integral part of the monetary system as specie flowed out of England and alternative methods were required to engage in efficient trade. The Bank of England was still quite new and lacked the ability to weather a significant crisis. It became more and more apparent that the costs of the war with France were finally beginning to compromise England's economic viability. As Dickson has shown, the structures that were to dictate eighteenth-century finance were already in

75. Ben S. Bernanke and Cara C. Lown, 'The credit crunch', *Brookings papers on economic activity* 1991:2 (1991), p.205-47.

76. Davenant, 'A memoriall concerning creditt', p.97.

place.[77] Davenant perceived these new structures, and his views on credit and the monetary sector were descriptions of the first creaking motions of this new engine of economic growth.

The considerable treatment of Davenant's monetary theory above is by no means complete; what has been described are the basic concepts that he had regarding money and credit in England in the 1690s. Davenant was able to see how new developments in public finance and private credit markets had changed the economy of England. New fiscal and financial instruments were altering the character of the established specie-driven system and therefore changing the internal dynamics. Gold and silver coin were very important but only as a monetary base, and money's definition was expanding to include other media. Davenant's proposals enable the reader to understand this development process and provide insights into why his proposal was rejected and Locke's accepted. The movement away from a pure specie system to a modern financial architecture was difficult for policymakers to understand. Davenant was one the of the few who did, though the influences of political patronage and a lack of understanding of monetary economics resulted in his ideas being considered only by Lord Godolphin, who, despite his rank in the Commons, was not in favour with the king.

The aftermath – institutional difficulty and economic collapse

The monetary effects of the demonetisation of clipped/lightweight coins in 1696 were not limited to the problems of the transactions demand for money. Demand for hard cash rose as a crisis of confidence gripped depositors in the Bank of England.[78] Already weakened by losses due to the exchange rate depreciation of 1695 and the management of Continental remittances to William's army since 1694, the Bank had little hope of sustaining itself in the presence of a considerable bank run. The demonetisation had destroyed all the remaining confidence in English coinage and depositors of the Bank of England demanded that their bills be honoured in specie.[79] The result was a classic credit crunch – as the demand for specie payments outstripped supply the run became a self-

77. Dickson, *Financial Revolution*.
78. Horwitz, *Parliament, policy and politics in the reign of William III*.
79. As Davenant had stated in his recommendations, the base of credit was specie, but that specie was now being altered, causing a crisis in confidence. The Bank of England's bank run was a result of the recoinage, as depositors attempted to exchange the notes of the Bank for hard currency. The ensuing credit crunch was consistent with Davenant's predictions.

fulfilling prophecy and the Bank of England was faced with collapse. Rose states:

> On 6 May, two days after the final demonetization of the clipped coin, a run on the Bank by cash-hungry depositors jeopardized its liquidity. Nor was the Treasury able to help the Bank in its hour of need, for the state's cash reserves remained locked up in the demonetized clipped coinage. Faced with the prospect of imminent financial collapse, the Bank swallowed a bitter pill. In early July it reneged upon its commitments to Continental creditors. At a stroke, confidence in English credit evaporated, leaving the army paymaster in Flanders penniless. Not until October was the Bank able to resume remittances to the army, and then only thanks to a substantial loan from a worried Dutch government.[80]

As the monetary sector continued to contract violently, the bimetallic situation continued to worsen. The price of the guinea had risen too high and was causing additional stress on the Mint and on the monetary and real sectors of the economy. Newton, as Master of the Mint, was responsible for the maintenance of the bimetallic standard; therefore he proposed a series of price changes to keep the newly coined silver from leaving England. Newton proposed a price ceiling on guineas fixed at 22s. This legislative action was to become only one subject of the great outcry in the government over the mishandling of the recoinage. As the king left for war in the spring of 1696 the country was in the grip of a liquidity crisis (one of the first 'modern' economic crises) and the inadequacy of the measures implemented by the government to retain the old standard was becoming rapidly apparent. As seen in Figures 1-4 the state of the national accounts, borrowings and coinage was deteriorating. Borrowing supported the war effort by 1695, revenues were falling short and the intrinsic metal content of the coinage had fallen to new lows. This grave situation was to be remedied by the Recoinage Act, but as William departed, it was more than apparent that the worst was yet to come. The Mint was terribly unprepared for the Act and Newton had only £700,000 of new milled coin on hand to reissue as £4.7 million had been brought to the Exchequer at that stage for transfer.[81] The lack of preparation was the result of a prior policy of staff reduction at the Royal Mint in London when mass quantities of new coinage were not required.[82]

The monetary collapse that ensued not only damaged the credibility of the Bank of England, but also resulted in the creation of new systems of

80. Rose, *England in the 1690s*, p.141.
81. Horwitz, *Parliament, policy and politics in the reign of William III*.
82. Mint facilities were still recovering from the disruptions of the republican period and the lack of additional mints beyond the Tower. (Li, *The Great Recoinage*, p.68-69, 135, 177.)

payment.[83] Bank of England notes had ceased to be a viable alternative to specie as the Bank defaulted and its bills were being heavily discounted. One statement by a correspondent of the Duke of Beaufort is telling on how grave the situation in London had become by the 5 May 1696:

> at this time all money is refused unless it be new money or very broad [that is, heavy or full weight], of which there is but little stirring. I was forced to enter my name in a book to pay for my dinner, for they choose rather to trust than take even passable sixpences. The Exchequer has a double guard these two days, and the common people begin to grow a little mutinous.[84]

The failure of silver as a medium of exchange left a gap that was filled by the guinea. It became the principal transactions currency during the recoinage, despite the fact that it was an extremely high denomination of anywhere between 22s. and 30s. in 1696. The demand on guineas and gold completely changed the market for silver bullion in England, with the price of gold and the price of guineas rising rapidly. This resulted in a gold inflow into England and a continued silver outflow. The eventual effect of this preference for gold was that it would take over the position of silver as the principal currency of England. Gold inflows to England dominated the concerns of the dealers on the Continent and guineas rapidly became the standard means of payment. By 1717, when Newton was still Master of the Mint and Davenant and Locke were both long dead, the quantity of silver coinage had all been reduced to small change. Newton continued to alter the mint price of the guinea throughout his administration due to its persistent overvaluation. The problem was not fully rectified until his final reduction of the Mint price of the guinea to 21s. By this time the quantity of gold coined was far outstripping that of silver, and in 1717, £15,186 of gold were coined and only £948 of silver.[85] There still existed a slight overvaluation of the guinea and as stated above only small denomination silver remained in circulation. This *de facto* status of gold as the readily accepted means of exchange and store of value created a mono-metallic standard, the famous British Gold Standard.

The Great Recoinage was an example of early modern economic policy at work. The objective of the Great Recoinage was to correct the problems of a debauched silver specie coin system. England's clipping and subsequent recoinage enabled it to continue with the war, and gain a

83. This was important since it undermined confidence in Bank of England notes, causing the domestic bank run and eliminating the trust that foreign lenders had in the institution, as the risk profile of the Bank of England rose following default.

84. Letter of 5 May 1696, quoted in Horwitz, *Parliament, policy and politics in the Reign of William III*, p.180.

85. Li, *The Great Recoinage*, p.148.

respectable peace with France. The importance of the Great Recoinage is that it advanced economic theory and strengthened the monetary system and institutions of England by forcing the major thinkers in England to find novel solutions to a potentially devastating monetary problem and. despite the initially inadequate solution, the gold standard was created and enabled a stable currency to exist until the French Revolutionary Wars and Napoleonic era.

The recoinage had been ill thought out and the proposals of both Locke and Lowndes were destined to result in an outflow of silver. The proposal for devaluation submitted by Lowndes was rejected and the silver-specie focused policy of Locke was adopted. This resulted in an overvaluation of guineas and continuing arbitrage of silver bullion out of the country. The monetary effects of the Bank of England default were substantial: England's economy calcified for most of 1696, resulting in massive unemployment, poverty and civil unrest.[86]

To treat the recoinage as only the product of Lowndes's and Locke's minds is insufficient. They led the debate, with Newton left to execute the plans of the government. Newton's errors in the valuation of guineas gave England a *de facto* gold standard. The monetary ideas that were created and expanded upon during the recoinage formed the foundations of eighteenth-century monetary thought. Lord Godolphin, who usually is thought to have considered only the opinions of Locke, Lowndes and Newton, also gave some attention to the ideas of many of those on the Commission, such as Charles Davenant. The Bank of England, paper credit, bills of exchange, the role of silver and gold, the need for specie and the ideas of free trade and the favourable balance of trade were all put to the test in these writings. As Sterling was recreated as a mono-metallic gold based currency and the Bank of England regained the respect and power it lost in the 1696 default, monetary theory advanced. Crises have the ability to strengthen surviving institutions and encourage innovative financial instruments. England's financial system was able to weather the wars of the early eighteenth century due to the discipline and lessons of this difficult period. In the area of economic theory, the writings of Davenant began a debate on the future of paper credit and economics that would continue throughout the eighteenth and nineteenth-century. Later publications like Daniel Defoe's periodical *Mercator* (1713-1714) and Charles King's *British merchant* (1721) discuss Davenant's contributions on the theory and measurement of trade and money. In the nineteenth century, Whewell, Jevons and Wicksteed drew heavily on Davenant's data and theories (though a

86. Horwitz, *Parliament, policy and politics in the Reign of William III*.

thought must be given to Gregory King, whose data Davenant used for his writings).[87]

The ideas and commentary of Davenant illustrate the rapid development of monetary theory at the time of the Recoinage. The Recoinage served the purpose of correcting the problem of clipping but inadvertently created the British Gold Standard. Davenant's work on coin and credit makes all the more apparent the depth of the 'Financial Revolution' described by Dickson and casts light on the importance of the Great Recoinage in the history of Britain, the development of Sterling and the history of economic thought.

87. William Whewell, 'Mathematical exposition of some doctrines of political economy, second memoir' [1850], in *Mathematical exposition of some doctrines of political economy* (New York, 1971); W. Stanley Jevons, *The Theory of political economy* (London, 1871); Philip H. Wicksteed, 'On certain passages in Jevons' theory of political economy', *Quarterly journal of economics* 3:3 (1889), p.293-314. See also Schumpeter, *History of economic analysis*, p.209-15; Stigler, 'Jevons on the King-Davenant law of demand'; G. Udney Yule, 'Crop production and price: a note on Gregory King's law', *Journal of the Royal Statistical Society* 78 (1915), p.296-98; Endres, 'The functions of numerical data in the writings of Graunt, Petty, and Davenant'; Endres, 'The King-Davenant "Law" in classical economics'; and Creedy, 'On the King-Davenant "Law" of demand'.